Section II. REMARKS

(I). Status of the Claims

Claims 1-61, 63-65, 68, 69, 71, 73-80, and 82 were previously pending in the present application, among which claims 1-38, 68, 69, and 75-79 were withdrawn from consideration, and claims 39-61, 63-65, 71, 73, 74, 80, and 82 were rejected by the Examiner.

Applicant has hereby cancelled claims 52, 57-61, and 64-65 and amend claims 39, 51, 53-56, 71, 80, and 82.

Therefore, claims 1-51, 53-56, 63, 68, 69, 71, 73-80, and 82 are currently pending, among which claims 1-38, 68, 69, and 75-79 are withdrawn from consideration, and claims 39-51, 53-56, 63, 71, 73, 74, 80, and 82 are under examination.

(II). Response to Objection to the Information Disclosure Statement

In the June 30, 2004 Office Action, the Examiner objected to the four English abstracts submitted by the Applicant with the April 26, 2004 Amendment as not being properly submitted, for lack of citation of such English abstracts in an Information Disclosure Statement form.

In response, Applicant hereby submits a corrected IDS form that cites the four foreign references and their respective English abstracts, together with copies of such references and English abstracts.

(III). Response to Objection to the Specification

In the June 30, 2004 Office Action, the Examiner objected to the instant specification, for failing to provide proper antecedent basis for the claimed subject matter in claims 52, 57, 58, 56, 59, and 71.

In response, Applicant has hereby cancelled claims 52, 57, 58, and 59 and amended claims 56 and 71.

The amended claim 56 now recites a system comprising:

"(a)one or more articles susceptible to contamination by infectious prion protein;

(b) means for heating said one or more articles;

(c) a proteolytic enzyme selected from the group consisting of keratinases and subtilisins; and

(d) means for exposing said articles to said proteolytic enzyme,

wherein said one or more articles are characterized by an elevated temperature of from about 40°C to about 60°C and exposure to said proteolytic enzyme."

Claim 56 as amended is therefore properly supported by the instant specification, which describes surgical instruments or like articles that are heated and simultaneously exposed to a proteolytic enzyme at a temperature that such proteolytic enzyme is thermally stable (see page 11, lines 9-16), and that certain proteolytic enzyme is thermally stable in an enzymatic treatment temperature of from about 40°C to about 60°C (see page 15, lines 14-16).

The amended claim 71 recites a system comprising:

"(a) a surgical instrument contaminated with infective prior protein; (b) means for heating the surgical instrument; (c) a proteolytic enzyme that is thermally stable at a temperature in a range of from about 35°C to about 100°C and proteolytically effective to at least partially destroy the infective prion protein contaminating said surgical instrument, and (d) means for exposing the surgical instrument to the proteolytic enzyme, wherein said surgical instrument is characterized by a first elevated temperature in a range of from about 100°C to about 150°C during a first duration, and wherein said surgical instrument is characterized by a second elevated temperature in a range of from about 35°C to about 100°C and exposure to the proteolytic enzyme during a second, subsequent duration."

Claim 71 as amended is supported by the instant specification, which describes surgical instruments or like articles that are first heat-treated and then exposed to a proteolytic enzyme (see page 4, lines 14-21), wherein the heat-treatment temperature is within the range of from about 100°C to about 150°C, and wherein the enzyme exposure temperature is within the range of from about 35°C to about 100°C (see page 5, last paragraph, and page 6, first and second paragraphs).

Therefore, the Examiner's objection to the instant specification has been overcome.

(IV). Response to Objection to Claim 60

In the June 30, 2004 Office Action, the Examiner objected to claim 60 as being of improper dependent form.

In response, Applicant has hereby cancelled claim 60.

(V). Response to Objection to Claims 39-61, 63-65, 71, 73, 74, 80, and 82

In the June 30, 2004 Office Action, the Examiner objected to claims 39-61, 63-65, 71, 73, 74, 80 and 82 for certain informalities and required corrections thereof.

Applicant has correspondingly cancelled claims 52, 57-61, and 64-65 and amended claims 39 (from which claims 40-51, 53-55, and 63 depend), 56, 71 (from which claims 73 and 74 depend), 80 and 82 to correct such informalities, consistent with the Examiner's requirements.

The amended claims 39, 40-51, 53-55, 56, 63, 71, 73-74, 80 and 82 thereby overcome the Examiner's objection.

(VI). Response to the §112 Rejections of Claims

In the June 30, 2004 Office Action, the Examiner rejected claims 39-41, 44-53, and 56-62[1] under 35 U.S.C. §112, first paragraph for lack of enablement, based on the assertion that the Applicant has not demonstrated the efficacy of the claimed invention for reducing the presence of prion protein at treatment temperatures of "not exceeding about 150°C," or "for temperatures of less than 50°C" (see the June 30, 2004 Office Action, pages 5-6, paragraph 10).

In response, Applicant has hereby cancelled claims 52 and 57-61 and amended claims 39 (from which claims 40-41, 44-51 and 53 depend) and 56.

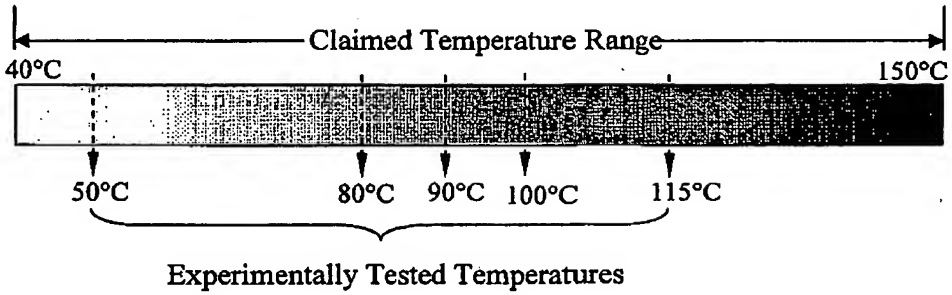
[1] In the April 16. 2004 Amendment, Applicant has already cancelled claim 62. Therefore, the Examiner's rejection of such cancelled claim 62 as stated on page 5, paragraph 10 of the June 30, 2004 Office Action is clearly a typographic error.

The amended claim 39, from which claims 40-41, 44-51 and 53 depend, recites:

> "A system comprising:
>
> (a) one or more articles susceptible to contamination by infectious prion protein;
>
> (b) means for heating said articles;
>
> (c) a proteolytic enzyme selected from the group consisting of keratinases and subtilisins; and
>
> (d) means for exposing said articles to said proteolytic enzyme,
>
> wherein said one or more articles are characterized by **a first elevated temperature of at least 40°C and not more than about 150°C** during a first duration, wherein said articles are characterized by a second elevated temperature in a range of from about 50°C to about 65°C and exposure to said proteolytic enzyme during a second, subsequent duration."

The Affidavit of Dr. Jason C.H. Shih as submitted with the April 16, 2004 Amendment has demonstrated that keratinases and subtilisins are effective in degrading and reducing infectious prion protein at various heat-treatment temperatures within the range of at least 40°C and not more than 150°C, in consummation with the claim scope of the amended claims 39-41, 44-51 and 53.

Specifically, Applicant has experimentally shown the efficacy of keratinases and subtilisins at **50°C, 80°C, 90°C, 100°C, and 115°C**, which covers a broad spectrum of heat treatment temperatures within the claimed range of at least 40°C and not more than 150°C, as follows:



In *In re Sarett*, 140 USPQ 474 (CCPA 1964), the Court specifically held that "it is certainly not incumbent on an applicant who has made a broad... invention and supported it by an adequately broad disclosure to demonstrate the operativeness of every substance falling within the scope of the broad claims to which he is entitled," and that "the research to do this would quite evidently be endless."

Therefore, the claimed temperature range of at least 40°C and not more than 150°C as recited by claims 39-41, 44-51 and 53 is properly supported and enabled by Applicant's demonstration that the keratinases and subtilisins are capable of reducing infective prion protein at heat-treatment temperatures of 50°C, 80°C, 90°C, 100°C, and 115°C. Sufficient empirical evidence thus has been adduced to support the claimed temperature range.

Claim 56 has been amended to recite:

> "A system comprising:
>
> (a) one or more articles susceptible to contamination by infectious prion protein;
>
> (b) means for heating said one or more articles;
>
> (c) a proteolytic enzyme selected from the group consisting of keratinases and subtilisins; and
>
> (d) means for exposure said articles to said proteolytic enzyme
>
> wherein **said one or more articles are characterized by an elevated temperature of from about 40°C to about 60°C and exposure to said proteolytic enzyme**."

As mentioned hereinabove, Applicant has experimentally shown the efficacy of keratinases and subtilisins in reducing infectious prion protein at **50°C**, which is within the claimed range of from about 40°C to about 60°C.

Therefore, the claimed temperature range of from about 40°C to about 60°C as recited by claim 56 is properly supported and enabled by Applicant's demonstration that the keratinases and subtilisins are capable of reducing infective prion protein at 50°C. Sufficient empirical evidence thus has been adduced to support the claimed temperature range.

In the June 30, 2004 Office Action, the Examiner rejected claims 64-65 under 35 U.S.C. §112, first paragraph for lack of enablement.

In response, claims 64-65 have been hereby cancelled.

Further, the Examiner's rejection to claims 56, 59, 71, 73, and 74 in the June 30, 2004 Office Action has been overcome by Applicant's cancellation of claim 59, and amendments of claims 56 and 71 (from which claims 73 and 74 depend). Specifically, the amended 56 is supported by the instant specification at page 11, lines 9-16 and page 15, lines 14-16, and the amended claim 71 is supported by the instant specification at page 4, lines 14-21, page 5, last paragraph, and page 6, first and second paragraphs, as mentioned hereinabove.

(VII). Response to the §103 Rejections of Claims

In the June 30, 2004 Office Action, the Examiner reiterated the previous rejection of claims 39-61, 63-65, 71, 73, 74, 80, and 82 under 35 U.S.C. §103(a) as being obvious over the primary reference World Health Organization (hereinafter "WHO") document, in view of numerous secondary references including Huth et al. U.S. Patent No. 6,448,062 (hereinafter "Huth"), Vlass et al. U.S. Patent No. 6,210,639 (hereinafter "Vlass"), Potgeiter et al. U.S. Statutory Invention Registration No. H1,818 (hereinafter "Potgeiter"), Shih U.S. Patent No. 5,171,682 (hereinafter "Shih"), Bolton et al., Molecular Characteristics of the Major Scrapie Prion Protein (hereinafter "Bolton"), and Oesch et al. Properties of the Scrapie Prion Protein: Quantitative Analysis of Protease Resistance (hereinafter "Oesch").

In response, Applicant has hereby cancelled claims 52, 57-61, and 64-65 and amend claims 39, 51, 53-56, 71, 80, and 82.

Applicant hereby traverses the Examiner's rejections, based on the following patentable distinctions between Applicant's claimed invention and the cited references.

Patentable Distinctions of Claims 39-41, 44-51, 53-55, 63, and 68-69

The amended claim 39, from which claims 40-41, 44-51, 53-55, 63, and 68-69 depend, expressly requires:

"A system comprising:

(a) one or more articles susceptible to contamination by infectious prion protein;

(b) means for heating said articles;

(c) a proteolytic enzyme selected from the group consisting of keratinases and subtilisins; and

(d) means for exposing said articles to said proteolytic enzyme,

wherein **said one or more articles are characterized by a first elevated temperature of at least 40°C and not more than about 150°C during a first duration, wherein said articles are characterized by a second elevated temperature in a range of from about 50°C to about 65°C and exposure to said proteolytic enzyme during a second, subsequent duration**."

The cited references, either taken singularly or in combination, do not provide any derivative basis for one or more articles that are characterized by (1) a first elevated temperature of at least 40°C and not more than about 150°C during a first duration; and (2) a second elevated temperature in a range of from about 50°C to about 65°C and exposure to a proteolytic enzyme during a second, subsequent duration, as expressly required by claims 39-41, 44-51, 53-55, 63, and 68-69 of the present application.

The primary reference cited by the Examiner, i.e., the WHO document, discloses sterilization of prion-contaminated surgical instruments by boiling or autoclaving with sodium hydroxide or sodium hypochlorite, followed by subsequent routine sterilization (see page 29, Appendix III, section 2 of the WTO document).

Such surgical instruments disclosed by the WHO document are characterized by an elevated temperature of about 100°C or higher during the boiling or autoclaving steps.

However, nothing in the WHO document teaches or suggests that such surgical instruments are further characterized by: a second elevated temperature in a range of from about 50°C to about 65°C and exposure to a proteolytic enzyme during a second, subsequent duration, as expressly required by claims 39-41, 44-51, 53-55, 63, and 68-69 of the present application.

None of the secondary references, Huth, Vlass Potgeiter, Shih, Bolton, and Oesch, can remedy such deficiency of the WHO document.

Specifically, none of the secondary references teaches or suggests surgical instruments that are characterized by an elevated temperature in a range of from about 50°C to about 65°C during exposure to a proteolytic enzyme.

Therefore, claims 39-41, 44-51, 53-55, 63, and 68-69 of the present application patentably distinguish over all cited references.

In the June 30, 2004 Office Action, the Examiner cited MPEP Section 2114, stating that the claimed apparatus "must be distinguished from the prior art in terms of structure rather than function," and that a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" so long as the prior art apparatus teaches all the structural limitations of the claim.

In response, Applicant hereby directs the Examiner's attention to the claim language of claim 39, which recites one or more articles characterized by "**a first elevated temperature of at least 40°C and not more than about 150°C during a first duration**" and **"a second elevated temperature in a range of from about 50°C to about 65°C and exposure to said proteolytic enzyme during a second, subsequent duration.**"

Such one or more articles as expressly recited by claim 39 are characterized by two distinctive physical states at two different durations, specifically, a first physical state defined by a first elevated temperature of at least 40°C and not more than about 150°C at a first duration, and a second physical state defined by a second elevated temperature in a range of from about 50°C to about 65°C as well as exposure to a proteolytic enzyme during a second, subsequent duration.

Such one or more articles with two physical states as recited by claim 39 are therefore distinctive physical elements and structural limitations that distinguish Applicant's claimed system from the systems disclosed in the cited references, because the cited references, either taken singularly or in combination, do not teach or suggest such distinctive physical elements or structural limitations required by claim 39 and its dependent claims.

Therefore, claims 39-41, 44-51, 53-55, 63, and 68-69 of the present application are patentable over the cited references.

Patentable Distinctions of Claim 56

The amended claim 56 expressly requires:

> "A system comprising:
>
> (a) one or more articles susceptible to contamination by infectious prion protein;
>
> (b) means for heating said one or more articles;
>
> (c) a proteolytic enzyme selected from the group consisting of keratinases and subtilisins; and
>
> (d) means for exposure said articles to said proteolytic enzyme,
>
> wherein **said one or more articles are characterized by an elevated temperature of from about 40°C to about 60°C and exposure to said proteolytic enzyme**."

The cited references, either taken singularly or in combination, do not provide any derivative basis for one or more articles that are characterized by an elevated temperature of from about 40°C to about 60°C and exposure to a proteolytic enzyme, as expressly required by claim 56 of the present application.

Nothing in the primary reference, i.e., the WHO document, teaches or suggests articles that are characterized by an elevated temperature in a range of from about 40°C to about 50°C and exposure to a proteolytic enzyme.

None of the secondary references, Huth, Vlass Potgeiter, Shih, Bolton, and Oesch, can remedy such deficiency of the WHO document.

Such one or more articles as expressly recited by claim 56 are characterized by a distinctive physical state defined by an elevated temperature in a range of from about 40°C to about 60°C as well as exposure to a proteolytic enzyme.

Such one or more articles as recited by claim 56 are therefore distinctive physical elements and structural limitations that distinguish Applicant's claimed system from the systems disclosed in the cited references, because the cited references, either taken singularly or in combination, do not teach or suggest such distinctive physical elements or structural limitations required by claim 56.

Therefore, claim 56 of the present application is patentable over the cited references.

Patentable Distinctions of Claims 71 and 73-74

The amended claim 71, from which claims 73-74 depend, expressly requires:

> "A system comprising (a) a surgical instrument contaminated with infective prior protein; (b) means for heating the surgical instrument; (c) a proteolytic enzyme that is thermally stable at a temperature in a range of from about 35°C to about 100°C and proteolytically effective to at least partially destroy the infective prion protein contaminating said surgical instrument, and (d) means for exposing the surgical instrument to the proteolytic enzyme, **wherein said surgical instrument is characterized by a first temperature in a range of from about 100°C to about 150°C during a first duration, and wherein said surgical instrument is characterized by a second temperature in a range of from about 35°C to about 100°C and exposure to the proteolytic enzyme during a second, subsequent duration**."

The cited references, either taken singularly or in combination, do not provide any derivative basis for a surgical instrument that is characterized by (1) a first elevated temperature of at least 100°C and not more than about 150°C during a first duration; and (2) a second elevated temperature in a range of from about 35°C to about 100°C and exposure to a proteolytic enzyme during a second, subsequent duration, as expressly required by claims 71 and 73-74 of the present application.

As mentioned hereinabove, the primary reference, i.e., the WHO document, discloses surgical instruments that are characterized by an elevated temperature of about 100°C or higher during the boiling or autoclaving steps, but nothing in the WHO document teaches or suggests that such surgical instruments are further characterized by a second elevated temperature in a range of from about 35°C to about 100°C and exposure to a proteolytic enzyme during a second, subsequent duration, as expressly required by claims 71 and 73-74 of the present application.

None of the secondary references teaches or suggests surgical instruments that are characterized by an elevated temperature in a range of from about 35°C to about 100°C during exposure to a proteolytic enzyme, and such secondary references therefore cannot remedy the deficiency of the WHO document.

Thus, claims 71 and 73-74 of the present application patentably distinguish over all cited

references.

Patentable Distinctions of Claim 80

Similar to claim 39, claim 80 requires "one or more articles... **wherein said articles are characterized by a first elevated temperature of at least 40°C and not more than about 150°C during a first duration, and wherein said articles are characterized by a second elevated temperature in a range of from about 50°C to about 65°C and exposure to the *Bacillus licheniformis* PWD-1 keratinase during a second, subsequent duration.**"

Therefore, claim 80 also patentably distinguishes over the cited references, for reasons corresponding to those set out hereinabove for claim 39.

Patentable Distinctions of Claim 82

Similar to claim 56, claim 82 requires "one or more articles... **wherein said articles are characterized by an elevated temperature of from about 40°C to about 50°C and exposure to *Bacillus licheniformis* PWD-1 keratinase.**"

Therefore, claim 82 also patentably distinguishes over the cited references, for reasons corresponding to those set out hereinabove for claim 56.

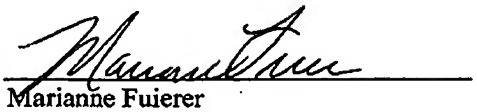
CONCLUSION

Based on the amendments made herein and the foregoing remarks, pending claims 1-51, 53-56, 63, 68, 69, 71, 73-80, and 82 as cancelled/amended herein are now in form and condition for allowance. The Examiner therefore is respectfully requested to reconsider and allow such amended claims.

No fee is rendered payable for this Response. Nevertheless, authorization hereby is given to the Office for charging any fee necessary for the entry of this Resposne to Deposit Account No. 08-3284 of Intellectual Property/Technology Law.

4171-102 CIP

Respectfully submitted,



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